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REMARKS/ARGUMENTS

Applicants submit this Amendment After Final to reply to the final Office Action dated January 13, 2006. Claims 1, 10 and 15 have been amended and Claim 12 has been canceled, without intending to abandon or to dedicate to the public any patentable subject matter. Accordingly, Claims 1-4, 6, 7, 9-11 and 13-20 are now pending. As set out more fully below, reconsideration and withdrawal of the rejections of the claims are respectfully requested.

Claims 10-17 and 19-20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,735,636 to Mokryn, et al. ("Mokryn"). In order for a rejection under 35 U.S.C. § 102 to be proper, each and every element as set forth in a claim must be found, either expressly or inherently described, in a single prior art reference. (MPEP § 2131.) However, all of the limitations set forth in the pending claims cannot be found in the Mokryn reference. Accordingly, reconsideration and withdrawal of the rejections of the claims are respectfully requested.

The Mokryn reference is generally directed to a device, system and method of intelligently splitting information in an I/O system. More particularly, Mokryn discusses an "intelligent splitter" that can intercept and alter an I/O stream from a communications link. (Mokryn, Abstract.) For example, during mirroring operations, write commands and data from a mainframe may be intercepted by the intelligent splitter, and the splitter may then transmit the intercepted I/O stream to the targeted control unit and storage location over one link and transmit on another link an altered version I/O stream to another control unit. (Mokryn, Abstract.) However, there is no discussion in Mokryn of a special message format for use in connection with data transfers between controllers that are less than a predetermined size, as set forth in the pending claims. Therefore, the pending claims are not anticipated by Mokryn, and reconsideration and withdrawal of the rejections of Claims 10-17, 19 and 20 are respectfully requested.

More particularly, Mokryn does not disclose at least the following italicized portions of independent Claim 10:

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10.   A method for mirroring using two controllers in a storage system, comprising:

making a determination related to contents of a first message with a first controller, wherein said first message is to be sent by said first controller to a second controller as part of a first mirroring operation, and wherein said first message is a message providing a first notification to the second controller that data will be mirrored to the second controller; and

producing said first message having contents that depends on said making step, wherein:

1)   when said making step determines that data to be sent comprises less than or equal to a predetermined number of bits, said first message includes metadata; and

2)   when said making step determines that said data is greater than said predetermined number of bits, at least less than all of said metadata associated with said first mirroring operation is not included with said first message.

As highlighted above, the Mokryn reference does not discuss a first message that is a first notification to the second controller that data will be mirrored to the second controller and in which the first message includes metadata when the data to be sent includes less than or equal to a predetermined number of bits. Indeed, there appears to be absolutely no discussion in Mokryn of an initial message that includes metadata, or of a determination by a controller, prior to sending a first message in connection with a mirroring operation, as to the number of bits included in data to be mirrored. Furthermore, because Mokryn does not discuss the content of an initial message sent as part of a mirroring operation, and because Mokryn does not discuss a controller that chooses between two different initial messages based on a number of bits included in user data to be mirrored, the rejections of Claims 10-14 as anticipated are improper, and should be reconsidered and withdrawn.

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Mokryn also does not disclose at least the following italicized portions of independent Claim 15:

15.   An apparatus for mirroring data using two controllers in a storage system, comprising:

a first controller that generates one of a first message and a second message depending on an amount of data to be sent by said first controller to a second controller as part of a first mirroring operation, wherein said first message is sent in response to determining that said amount of data to be sent by said first controller is less than or equal to a predetermined number of bytes, wherein said first message comprises metadata related to user data included in said first mirroring operation; and

a second controller that receives said data from said first controller, *wherein when said first or second message is sent by said first controller said first or second message comprises an initial notification message to said second controller related to the first mirroring operation.*

As previously noted, the Mokryn reference does not discuss a first controller that generates either a first message or a second message depending on the amount of data to be sent by the first controller to the second controller as part of a mirroring operation. Additionally, Mokryn does not discuss sending a first message that comprises metadata related to user data included in the first mirroring operation and that comprises an initial notification message to the second controller related to the first mirroring operation. More particularly, because Mokryn does not discuss either the content of an initial notification message sent as part of a mirroring operation, or a process that includes selecting between a message of a first type and a message of a second type based on an amount of data included in a mirroring operation, the rejections of Claims 15-17, 19 and 20 as anticipated by Mokryn should be reconsidered and withdrawn.

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Claims 1-9 and 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mokryn in view of U.S. Patent No. 6,574,709 to Skazinski, et al. ("Skazinski"). In order for a rejection under 35 U.S.C. § 103 to be proper there must be some suggestion or motivation to modify the reference, or to combine the reference teachings, there must be a reasonable expectation of success, and the prior art reference or references must teach or suggest all of the claim limitations. (MPEP § 2143). However, all of the limitations as set forth in the pending claims are not taught, suggested, or described in either of the above-mentioned references. Accordingly, reconsideration and withdrawal of the rejections of Claims 1-9 and 18 are respectfully requested.

As noted above, the Mokryn reference does not discuss generating an initial notification message having metadata. More particularly, Mokryn does not discuss the content of a notification message at all. Accordingly, Mokryn does not suggest or disclose an initial notification message generated by a first controller in a controller pair that includes metadata and that is provided to a second controller of the pair. Furthermore, the deficiencies in the Mokryn disclosure with respect to Claims 1-9 and 18 are not made up for by the disclosure of the Skazinski reference.

The Skazinski reference discusses a mirror map that is comprised of 128 bits, where each bit represents a block of data in a cache line. However, there is no teaching, suggestion or disclosure in Skazinski of an initial notification message provided by a first controller to a second controller as part of a mirroring operation in which the initial notification message is not greater than 128 bits. Therefore, for at least these reasons, Claims 1-9 and 18 are not obvious over the proposed combination of the Mokryn and Skazinski references, and the rejections of these claims as obvious should be reconsidered and withdrawn.

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More particularly, at least the portions of Claim 1 set forth below in italicized text are not taught, suggested or disclosed by Mokryn or Skazinski:

    1.   A method for mirroring data using two controllers in a storage system, comprising:

    providing a first message comprising a write mirror message that includes metadata by a first controller to a second controller and in which said first message including said metadata is not greater than 128 bits, *with said first message being part of a first mirroring operation, wherein said first message is generated by said first controller, and wherein said first message comprises an initial notification message*; and

    continuing with said first mirroring operation after said providing a first message by providing a second message comprising a data mirror message that includes user data to said second controller.

Because the cited references, whether considered alone or in combination, do not teach, suggest or describe an initial notification message that includes metadata, Claims 1-9 are not obvious. In addition, Claims 1-9 are not obvious for at least the additional reason that the cited references do not teach, suggest or disclose a first message comprising an initial notification message that includes metadata, and a second message that comprises user data.

With respect to Claim 18 which depends from Claim 15, and as noted above, the Skazinski reference does not teach, suggest or describe a first controller that generates one of a first message and a second message depending on an amount of data to be sent, wherein the first message comprises metadata. Moreover, the Skazinski reference also does not teach, suggest or describe a controller that generates one of a first message and a second message depending on an amount of data to be sent by the first controller to the second controller as part of a mirroring operation. Accordingly, the rejection of Claim 18 as obvious should be reconsidered and withdrawn.

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     Based upon the foregoing, Applicants believe that all of the pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

                    Respectfully submitted,

                    SHERIDAN ROSS P.C.

By:

                    Bradley M. Knepper
                    Registration No. 44,189
                    1560 Broadway, Suite 1200
                    Denver, Colorado 80202-5141
                    (303) 863-9700

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